

C. Remarks

The claims are 1-3, with claim 1 being the sole independent claim.

Reconsideration of the claims is expressly requested.

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being allegedly obvious from U.S. Patent No. 4,825,249 (Oki) in view of U.S. Patent Nos. 3,024,209 (Ferrigno) and 3,387,071 (Cahill). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly discuss some of the features and advantages of the presently claimed invention. That invention, in pertinent part, is related to a process for producing a cleaning blade. This process includes the steps of (1) drying a blade formed of a urethane resin so that the urethane resin has a water content of 1% by weight or less; (2) impregnating at least a contact portion of the blade with an isocyanate compound; (3) blowing warm air or hot air on the blade surface to remove the isocyanate compound remaining on the blade surface; and (4) allowing the urethane resin that forms the blade to react with the isocyanate compound with which the blade stands impregnated, to form a cured layer formed chiefly of allophanate linkages. In addition to the limited water content of the urethane blade, the isocyanate compound has at least two isocyanate groups in one molecule. As a result, a cured layer can be more effectively formed.

Oki is directed to a method for producing a cleaning blade for an electrophotographic copying machine. Specifically, Oki discloses improving the ware resistance, lubricating, and cleaning properties of a urethane blade, by coating this blade with either a perfluoropolyether having an isocyanate, hydroxyl, carboxyl, or amino group

at least at one end thereof, or a mixture of this perfluoropolyether and an isocyanate compound or a hydroxyl compound (col. 2, lines 61-68). The perfluoropolyether reacts with a surface of the blade to form a coating (col. 3, lines 32-41).

Oki, however, does not disclose or suggest a method in which the urethane blade, after being dried, is impregnated with an isocyanate compound as claimed. Oki, as mentioned above, discloses that the reaction occurs only on the urethane surface. Specifically, in Oki, the perfluoroether coating is formed on the urethane surface, whereas in the present invention, the isocyanate groups impregnated into the inside of the urethane are allowed to react inside the urethane to form allophanate bonds, or to react with each other to form a carbodiimide or isocyanurate.

The Examiner referred to column 2, lines 15-23, in Oki and alleged that Oki's treatment causes the surface layer to form allophanate bonds to the extent that only some of the layer is left untreated (formed chiefly of allophanate linkages). However, this portion in Oki does not relate to Oki's blade formation; it provides background information on a general urethane-related reaction.

The formation of allophanate bonds described in Oki relates to a typical reaction of isocyanate groups, and does not directly relate to the formation of a urethane blade. It is merely described that isocyanate groups are allowed to react with hydroxyl groups to form urethane bonds and with amino groups to form urea bonds. Also, the urethane bonds and the urea bonds are allowed to react with isocyanate groups to form allophanate bonds and biuret bonds.

Oki teaches that in a reaction of isocyanate groups with hydroxyl groups, unreacted groups remain, and a perfluoroether is provided with groups capable of reacting with the unreacted isocyanate groups and hydroxyl groups, thereby improving the wear resistance of the coating. That is, when introducing into the perfluoroether at least one of an isocyanate group, a hydroxyl group, a carboxyl group, and an amino group capable of reacting with the unreacted isocyanate and hydroxyl groups remaining on the urethane surface, a reaction is caused on the urethane surface so that adhesion is enhanced as compared with the case where the periphery of the urethane is only coated with a perfluoroether.

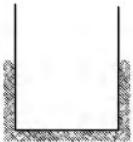
In addition to failing to disclose impregnation as presently claimed, Oki, as acknowledged by the Examiner, does not disclose the presently claimed water content after drying. Applicants respectfully submit that Oki teaches away from reducing the moisture content to the presently claimed level.

In Oki, the presence of water only increases the necessary functional groups. To the contrary, in the present invention, carbon dioxide generated simultaneously with amino groups forms a foam, which leads to a roughened surface. Thus, the present invention is different from Oki in that it is necessary to control the water content. In addition, since Oki does not disclose water content control and the process therein would appear to benefit from an increased water content, there is no reason to limit the water content in Oki as presently claimed based on the disclosure in Ferrigno.

Furthermore, in Oki, as mentioned above, a coating is formed by a perfluoroether layer on the urethane blade. Therefore, excess perfluoroether need not be

removed. In general, unnecessary perfluoroether spontaneously falls off and is removed during the course of coating. Accordingly, there is no reason to carry out the removal in Oki based on Cahill.

The following table provides a list of some of the differences between the present invention and Oki.

	Oki	The preset invention
Reaction area	Only on the urethane surface	Includes the inside portion of the urethane blade
Formed product	Perfluoroether coating 	Formation of allophanate bonds due to a reaction of urethane and isocyanate groups, and formation of carbodiimide and isocyanurate due to a reaction of isocyanate groups with each other 
Necessity of water content control	Isocyanate groups react with water to form amino groups. Amino groups are functional groups, which are preferably present in the perfluoroether. Water does not inhibit a reaction or present a problem.	Reaction of isocyanate groups with water produces amino groups and carbon dioxide. When carbon dioxide is produced inside the urethane, the resulting foam roughens the urethane surface, i.e., the water content control is necessary.

In conclusion, Applicants respectfully submit that whether considered separately or in any combination, the documents of record fail to disclose or suggest the presently claimed elements. Wherefore, withdrawal of the outstanding rejections and passage of the application to issue are respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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